

PATENT SPECIFICATION

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(54) SAMPLING APPLIANCE FOR GRAIN

(71) We, EINFUHR- U. VORRATSTEILE FÜR GETREIDE UND FUTTERMITTEL, a German Anstalt des öffentlichen Rechts, of Adickesallee 40, 6000 Frankfurt am Main 18, Federal Republic of Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to a sampling appliance which is used particularly for grain.

For the appraisal and examination of grain shipments it is necessary to take samples at arbitrary points of the store. For this purpose so-called single-chamber and multi-chamber probes are used which are introduced manually into the loose bulk material. The use of these probes involves high expenditure of energy and is limited by the displacement resistance, which increases with depth.

The consequence of this is that inspection of the stocks or sampling is not possible at all in the case of heaps having a height of more than 3 metres.

The present invention has the object of producing a sampling appliance which is convenient to operate and with the aid of which a rapid and clean sampling can be carried out, and even heaps having a heap height of 5—6 metres, now frequently achieved, can be sampled.

In accordance with the invention a sampling appliance comprising an extensible suction pipe one end of which forms a mouthpiece and the other end of which is connected through a flexible hose with a blower and a separator, and a container for collecting material entrained in the air stream induced in the pipe by the blower and removed therefrom by the separator, the blower, the separator, and the container being mounted on a carrier frame to provide a portable unit to be carried like a rucksack or back pack, and the pipe comprising a plurality of pipe pieces which are detachably assembled.

In order to achieve the most uniform possible sucking over the entire height of the

heap, it is preferred that the mouthpiece of the pipe has a quantity-regulating spiral. It further contributes to the uniform sampling if bores or auxiliary entry holes are arranged in the region of the mouthpiece in the pipe.

Finally the use of a double pipe ensures that the quantities of air necessary for the transport of the sample are always available to an adequate extent.

The invention will be described in greater detail hereinafter with reference to an embodiment which is illustrated in the accompanying drawings, wherein:—

Figure 1 shows a portable sampling appliance according to the invention;

Figure 2 shows a perspective view of a double-walled pipe;

Figure 3 shows the mouthpiece of a single-walled pipe, partially in section;

Figure 4 shows a view of a pipe piece serving for extension;

Figure 5 shows a lateral view of the part of the appliance consisting of blower, separator and container and

Figure 6 shows a further rear view of the same part.

The portable sampling appliance as illustrated in Figure 1 consists of an extensible pipe 2, of which one end or mouthpiece 3 is open and the other end 4 is connected through a flexible hose 5 with a blower 8 comprising a separator 6 and a container 7.

The part of the appliance consisting of blower 8, separator 6 and container 7 is portable and has for this purpose a carrying frame 9 so that it can be transported like a rucksack. The hose 5, as appears especially from Figure 6, is connected with the suction connection 10 of the blower 8 so that a negative pressure always prevails in the pipe 2. Thus the sample is taken up at the mouthpiece 3 and entrained by the air flowing to the blower 8 and the separator 6.

The pipe 2 is assembled from several pipe pieces 11 which have bayonet catches 12 on their ends, serving for securing. In the taking of the sample the mouthpiece 3 of the pipe 2 is pressed by hand deeper and deeper into

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the heap as the material is sucked away, it being necessary to attach fresh pipe pieces 11 in each case at the end 4 of the pipe 2, until samples situated at the bottom of the 5 heap are also sucked away. The hose 5 must in this case be removed repeatedly from the pipe 2, so that the necessary pipe pieces 11 can be inserted. The hose can advantageously further be fitted in airtight manner onto the 10 pipe 2 or the pipe pieces 11, and easily released again.

According to Figure 3 on the free end of the mouthpiece 3 there is a quantity-regulating spiral 12 with the aid of which 15 an especially uniform and continuous taking of the sample is achieved. It prevents a column of grain from rising without the flow cross-section being substantially reduced. Finally if auxiliary bores 13 are provided also 20 in the region of the quantity regulating spiral 12 in the pipe 2, an even better flow of the grain is obtained.

When a quantity-regulating spiral 12 is used, the expenditure of force and the tendency to blockage are at the minimum, and 25 at the same time a favourable quantity-regulation and a continuous conveying operation are achieved.

As a rule in the interior of the heap there 30 is plenty of air which can transport the sample after the generation of a negative pressure at the mouthpiece 3. However for the case where the air quantity does not suffice, a double-walled pipe 14 is used through the 35 internal pipe 15 of which the grain is sucked away while the compensating air necessary to maintain the transport operation can flow in through the outer pipe 16.

With the aid of the sampling appliance any 40 grain store can be examined rapidly and reliably and all damaged parts, floor adhesions or water penetration can be located or defined exactly in dimensions. Furthermore it is now possible to utilise the storage spaces further 45 since the heap height is no longer limited by the working range of the sampling appliances known hitherto.

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WHAT WE CLAIM IS:—

1. A sampling appliance comprising an extensible suction pipe one end of which forms a mouthpiece and the other end of which is connected through a flexible hose with a blower and a separator, and a container for collecting material entrained in the air stream induced in the pipe by the blower and removed therefrom by the separator, the blower, the separator, and the container being mounted on a carrier frame to provide a portable unit to be carried like a rucksack or back pack, and the pipe comprising a plurality of pipe pieces which are detachably assembled. 50
2. A sampling appliance according to claim 1, wherein the mouthpiece of the pipe contains a quantity-regulating spiral. 60
3. A sampling appliance according to claim 2, wherein the pipe has auxiliary entry holes in the region of the quantity-regulating spiral. 65
4. A sampling appliance according to claim 1, 2 or 3, in which the pipe is a double pipe, the inner and outer pipe walls being arranged concentrically with one another. 70
5. A sampling appliance according to any of claims 1—4, wherein the pipe and the hose are connected with a suction connector of the blower. 75
6. A sampling appliance according to any of claims 1—5, wherein the pipe pieces forming the pipe are connected with one another by a bayonet catch. 80
7. A sampling apparatus constructed and arranged substantially as hereinbefore described and shown in the accompanying drawings. 85

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1399990 COMPLETE SPECIFICATION
2 SHEETS *This drawing is a reproduction of
the Original on a reduced scale*
Sheet 1

Fig. 1

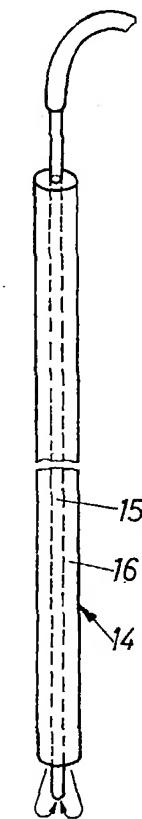
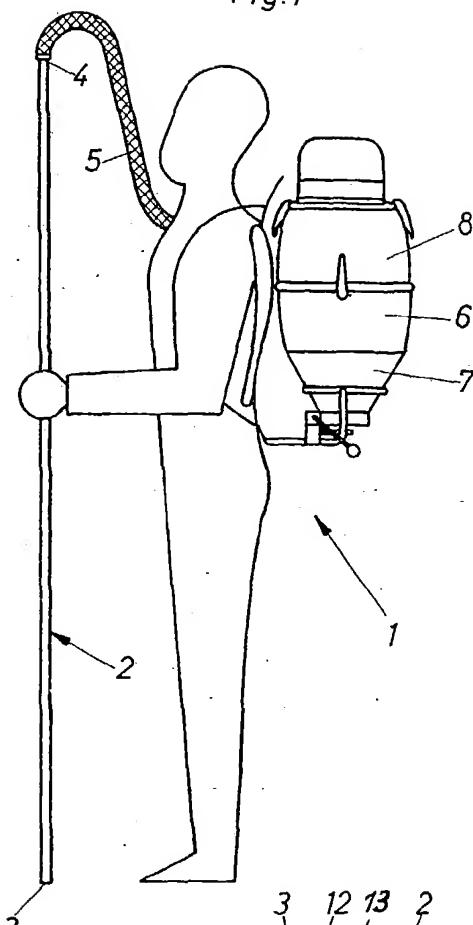


Fig. 2

Fig. 3

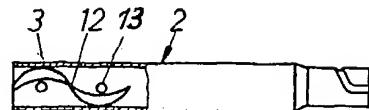


Fig. 4



